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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,272	03/31/2006	Mitsuhiro Oshiki	389.46065X00	9796
20457 7590 08/06/2010 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873				
EXAMINER				
GRAF, NEIL J				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



### Office Action Summary

**Application No.**

10/574,272

**Applicant(s)**

OSHIKI ET AL.

**Examiner**

NEIL J. GRAF

**Art Unit**

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 June 2010 and 15 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 June 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_



## DETAILED ACTION

### *Drawings*

1. The drawings were received on 6-3-10. These drawings are accepted.

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 9-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10, 12-14 of copending Application No. 11/577,005. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 and 8 for Application No. 11/577,005 recite an ultrasonic probe where a bias is utilized to control sensitivity, where controlling the bias to transducers also controls the electromechanical coupling coefficient. Components such as a preamplifier, an



image processor means, and display means are common and well known in the art of ultrasonic technology. Claims 2-7 and 9-10, 12-14 of Application No. 11/577,005 are rejected as obvious design choices for the diagnostic ultrasound apparatus, where it is well known cMUT transducer technology can have an infinite number of design variations as to the placement and operation of each individual element within a particular transducer design. Lastly, claim 21 of Application No. 10/574,272 is directed toward a method that is an obvious use of the claimed apparatus of copending Application No. 11/577,005.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 9-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, 10-13, 15-16 of copending Application No. 11/577,334. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed components of transmitting and receiving units, ultrasonic probes with one or more transducers that contain electrodes to which bias' are applied, where the sensitivity can be varied with respect to the bias voltage is what is claimed or inherent in the instant application, where the electromechanical coupling coefficient is changed as a result of the bias applied to the transducers. Other limitations such as varying the frequency bandwidth, phase, and performing Doppler signal processing are rejected as being obvious design and operation choices that are well known in the art of ultrasonic transducer technology. Lastly, claim 21 of Application No. 10/574,272 is directed toward a method that is an obvious use of the claimed apparatus of copending Application No. 11/577,005.



This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claims 9-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 8 of copending Application No. 11/913,959. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant application explicitly discloses or inherently contains an ultrasonic apparatus that contains an ultrasonic probe with a transmitting and receiving means, where the element selecting means for selecting a plurality of oscillation elements would correspond to an inherent control means to control the switching means for applying the desired bias to the respective electrodes. Lastly, claim 21 of Application No. 10/574,272 is directed toward a method that is an obvious use of the claimed apparatus of copending Application No. 11/577,005.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 9-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 11/571,782. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant application explicitly discloses or inherently contains an ultrasonic apparatus that contains an ultrasonic probe with one or more transducer elements with a transmitting and receiving means, where other limitations including an image processing unit, a step of inputting a common drive signal or selecting a predetermined number of groups, or performing phasing addition are considered to be obvious design choices for those of ordinary



skill in the art of ultrasonic transducer design and operation . Lastly, claim 21 of Application No. 10/574,272 is directed toward a method that is an obvious use of the claimed apparatus of copending Application No. 11/577,005.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

*Claim Rejections - 35 USC § 112*

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1, 3-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Throughout the specification and figures the term “means” is recited without providing examples of what structure is defined by elements that contain this term, e.g. bias means, correction control means.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 7,9-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.



Regarding claims 7, 9, 10, 17 applicant asserts that the claim elements “switching means,” “transmitting means,” .....is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, it is unclear whether the claim element is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph, because the claims as written are modified by sufficient structure, material, or acts for achieving the specified functions, and therefore not compliant. If applicant wishes to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to:

(a) Amend the claim to include the phrase “means for” or “step for” in accordance with these guidelines: the phrase “means for” or “step for” must be modified by functional language and the phrase must **not** be modified by sufficient structure, material, or acts for performing the claimed function; or

(b) Show that the claim limitation is written as a function to be performed and the claim does **not** recite sufficient structure, material, or acts for performing the claimed function which would preclude application of 35 U.S.C. 112, sixth paragraph. For more information, see MPEP § 2181.

10. Claim 15 is indefinite where a single oscillation element is recited, where previous claim language recites “oscillation elements.”

11. Regarding Claim 21, “each group” of line 8 lacks antecedent basis.

#### ***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:



A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 3-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Savord et al. (Patent No.: US 6,381,197).

Regarding claims 1, 3- 21, it is noted Savord et al. discloses a plurality of transducers (see Figure 4A for 52, 54, 56) for transmission and reception of ultrasonic waves for interrogation of objects such as solids, where inherent in the semiconductor silicon oscillation elements (MUT elements) is the characteristic of changing the electromechanical coupling coefficient in accordance with the strength of a direct-current bias (see column 1 for lines 21-32 and lines 54-67 and column 2 for lines 21-26). Savord et al. further discloses a plurality of the oscillation elements of equal number being divided into a plurality of groups with equal intervals in a minor and major axis direction that are commonly connected, where it is also disclosed the distance between each MUT element can be varied for purposes such as aperture control, in addition to varying the gain of each MUT element to produce a different bias for each group for the purpose of apodization and elevation/image depth control (see Figure 5A for the arrangement of the MUT elements 11a, b, c...with the MUT elements being commonly connected as shown by 1, 2, 3, V<sub>1</sub>, V<sub>2</sub>, column 5 for lines 51-57, and column 7 for lines 1-10, 29-35). Savord et al. further discloses a terminal with a distribution means that is connected to system electronics for control and bias purposes, which includes a switching means for selectively applying a bias when ultrasonic waves are transmitted and received (see column 3 for lines 61-67, column 4 for lines 1-4, Figure 4A for 1-3, 57a-c, 32). Savord et al. further discloses a method for biasing a plurality of oscillation elements where an electromechanical coupling coefficient would



inherently be changed, to transmit and receive ultrasonic waves to an object for reconstruction of an ultrasound image, where an imaging processing and storage means would be inherent for these processes (see column 2 for lines 49-64 and column 8 for lines 4-8). Further, inherent would be a correction control means for the process described by Savord et al. to dynamically vary the apodization and aperture control, in a continuous manner, where the bias change would incorporate a correction of the electromechanical coupling coefficient (column 6 for lines 51-53). Savord et al. lastly discloses applying a bias having weight for groups of MUT elements either symmetrically with increasing bias towards the center of the aperture, or asymmetrically with a moving window with respect to the center of an ultrasonic aperture, thereby providing for the ability to control the lateral aperture by selectively controlling the activation of the MUT elements (see column 4 for lines 36-67, column 6 for lines 26-49, column 7 for lines 16-53).

### ***Response to Arguments***

14. Applicant's arguments filed on 6-3-10 have been fully considered but they are not persuasive. Regarding Applicant's arguments directed to 35 U.S.C 112, first paragraph, it is noted Examiner respectfully disagrees proper examples are provided for structure defined using the term "means." For Applicant's arguments provided for 35 U.S.C. 112, second paragraph, Examiner respectfully disagrees that claims should not be amended for claim language that recites "means" terminology. Such terminology is unclear as written, if means plus function language applies. Importation of limitations from Applicant's specification for examination purposes is improper. For Applicants arguments directed towards the plurality of oscillation elements, Examiner respectfully disagrees that Savord does not teach these limitations, where



Savord teaches the ability to control the lateral aperture and gain with control of the MUT elements. For Applicant's arguments directed towards claim 21 for varying the number of oscillation elements in each group relative to the distance from the center of the ultrasonic probe, it is noted that this claim limitation is not incorporated into claim language of claim 21.

### *Conclusion*

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEIL J. GRAF whose telephone number is (571)270-5366. The examiner can normally be reached on M-F, 7:30-5 pm.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/  
Primary Examiner, Art Unit 3737

/NEIL J. GRAF/  
Examiner, Art Unit 3737